

Armed Forces College of Medicine AFCM

BI OOD SUPPLY OF THE GIT By Professor Azza Kamal

ANATOMY DEPARTMENT



ILO

- Describe origin and branches of coeliac trunk.
- Describe origin, course, important relations & branches of superior & inferior mesenteric arteries & veins

KEY POINTS OF LECTURE

Origin, course, important relations and :branches of

- 1) The coeliac trunk
- 2) Superior mesenteric vessels
- 3) Inferior mesenteric vessels

Arteries of the gut (single brs from abdominal aorta)

Coeliac trunk (artery of foregut)

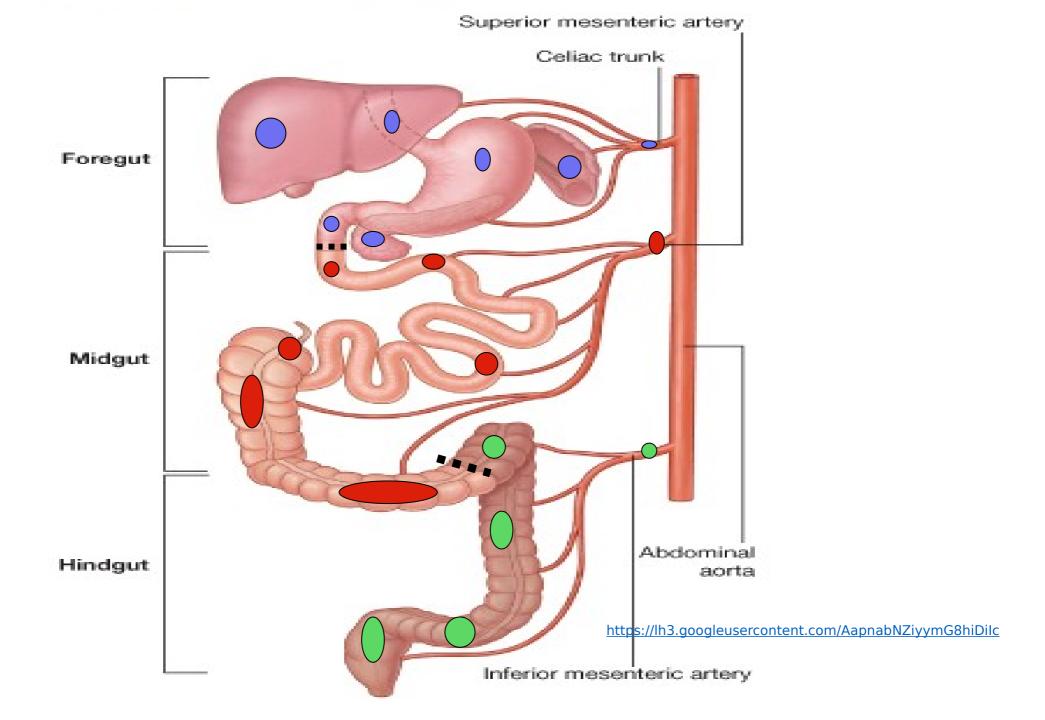
Supplies lower part of oesophagus, stomach, upper p of duodenum, pancreas, liver & spleen

Superior mesenteric (artery of midgut)

Supplies lower part of duodenum, jejunum, ileum, caecum, ascending colon & rt 2|3 of tr colon

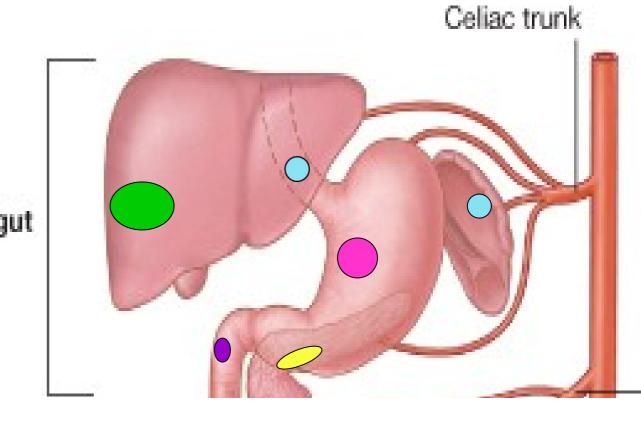
Inferior mesenteric (artery of hindgut)

Supplies left 1|3
of tr
colon, descending &
Sigmoid colon,
rectum
& upper p of anal
canal



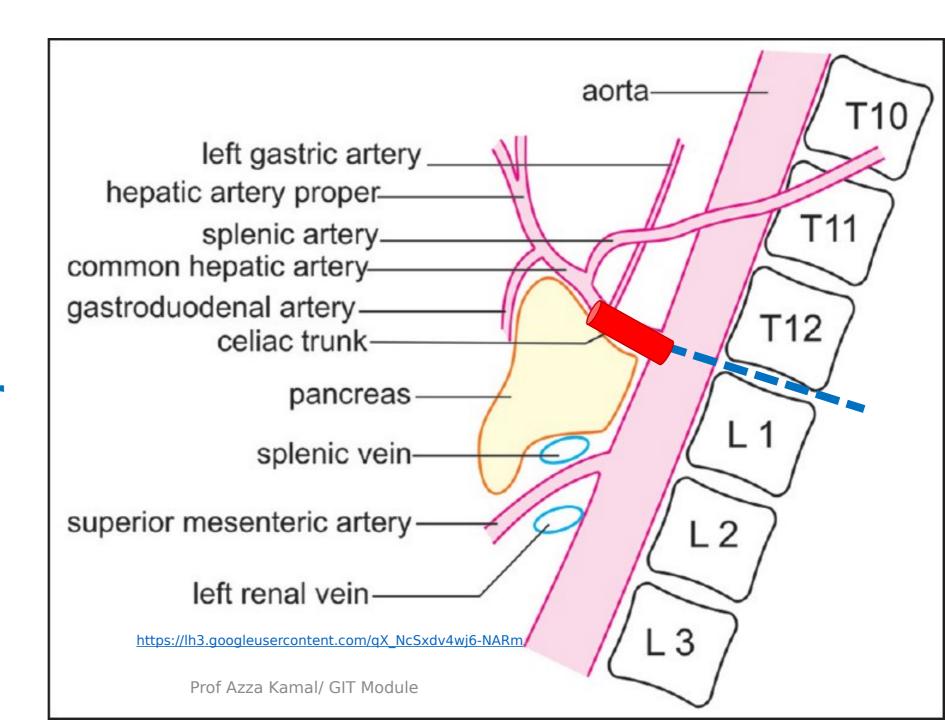
1. The Coeliac Trunk

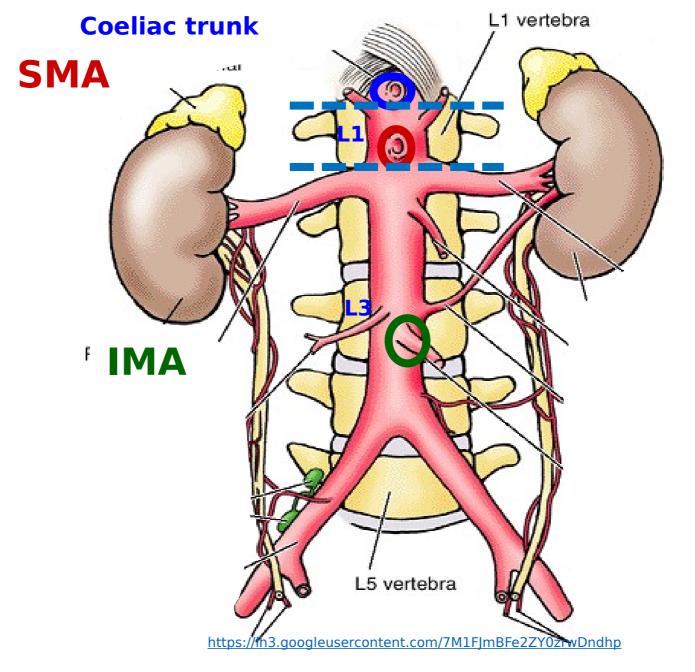
•It is the artery of the foregut supplies lower part of oesophagus, Foregut stomach, upper ½ of duodenum, liver, spleen & pancreas



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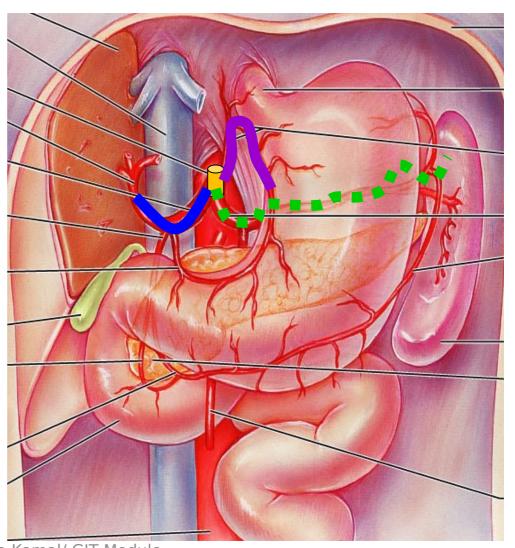
Origin front of abdominal aorta opposite lower border of T12 (upper border of

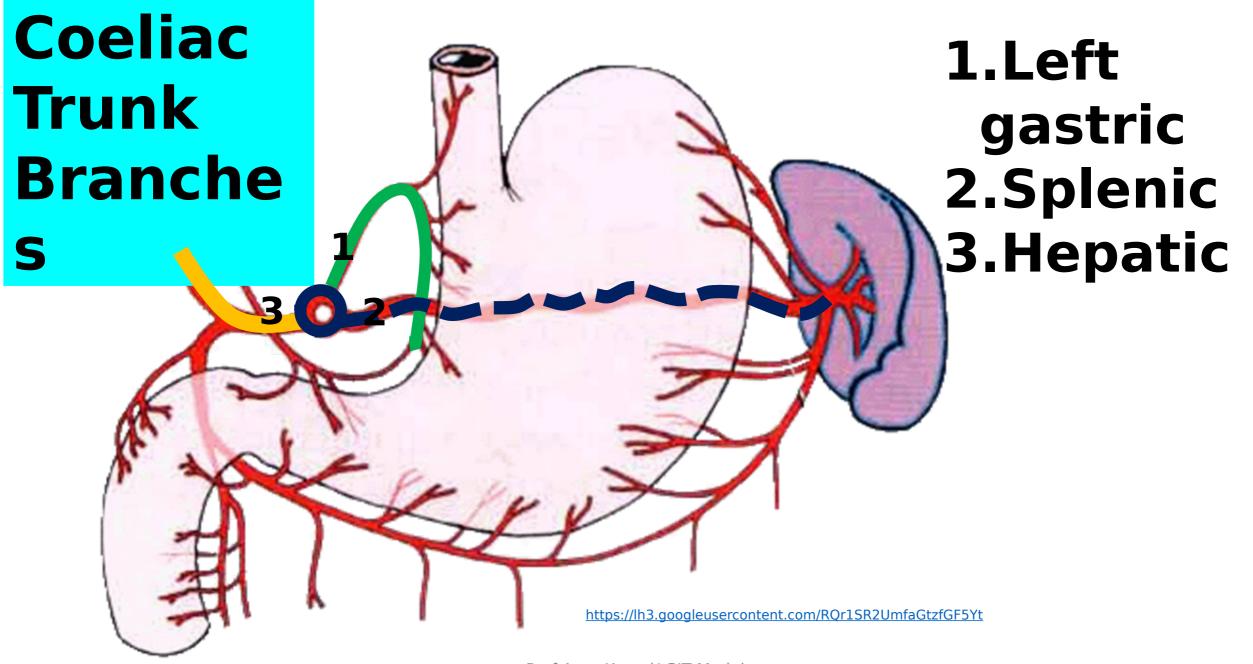




The Coeliac Trunk

- Termination it is a short trunk (1/2 inch) which divides into 3 terminal branches:
- 1. Left gastric artery
- 2. Splenic artery
- Https://lha.googleusercontent.com/fDrFVjKp4YfAdP2uocnlxJ0h





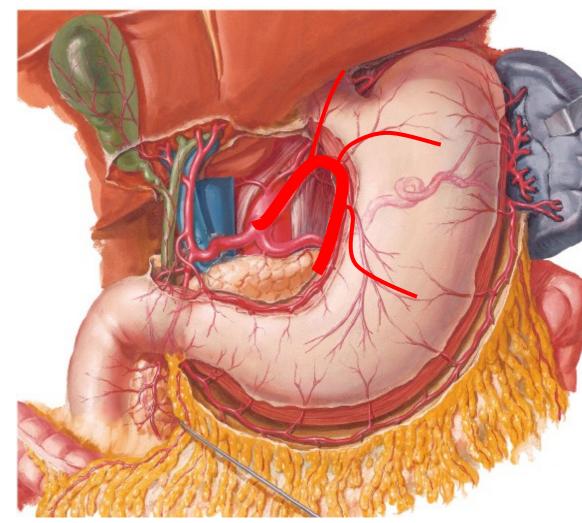
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Left Gastric Artery

- Course:
- Smallest branch

It passes to the left along the lesser curvature of stomach.

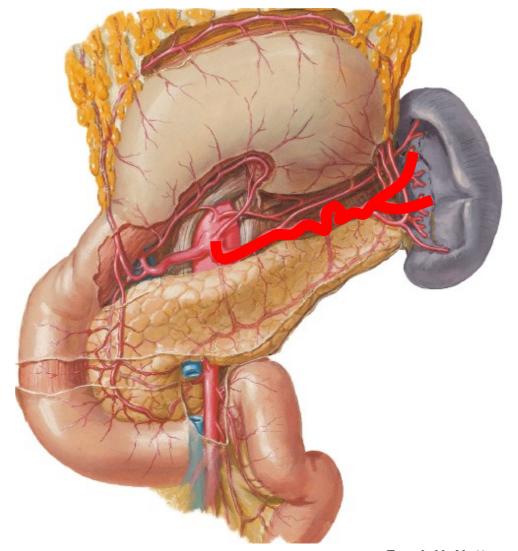
- Branches:
 - 1. Esophageal branches.
 - 2. Gastric branches.



Splenic Artery

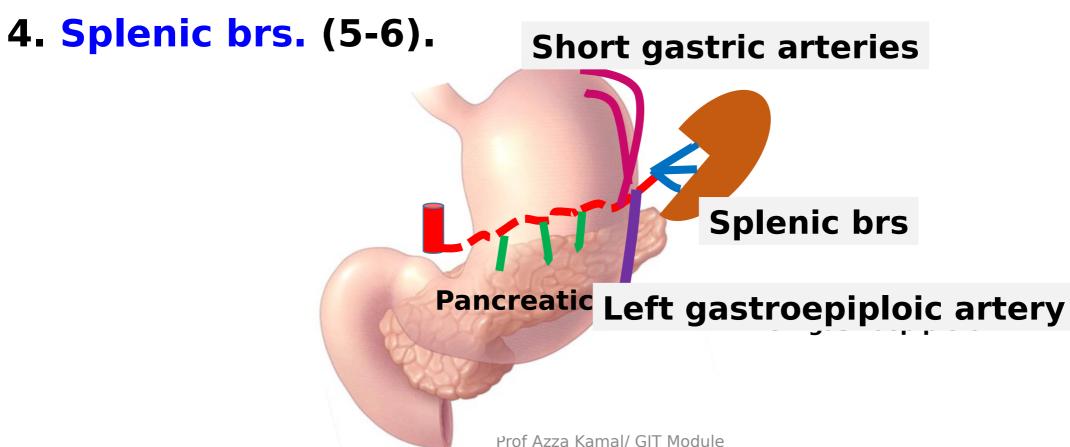
Course:

- Largest branch
- Tortuous course
- Passes to the left along the upper border of pancreas, behind the stomach
- ∏spleen



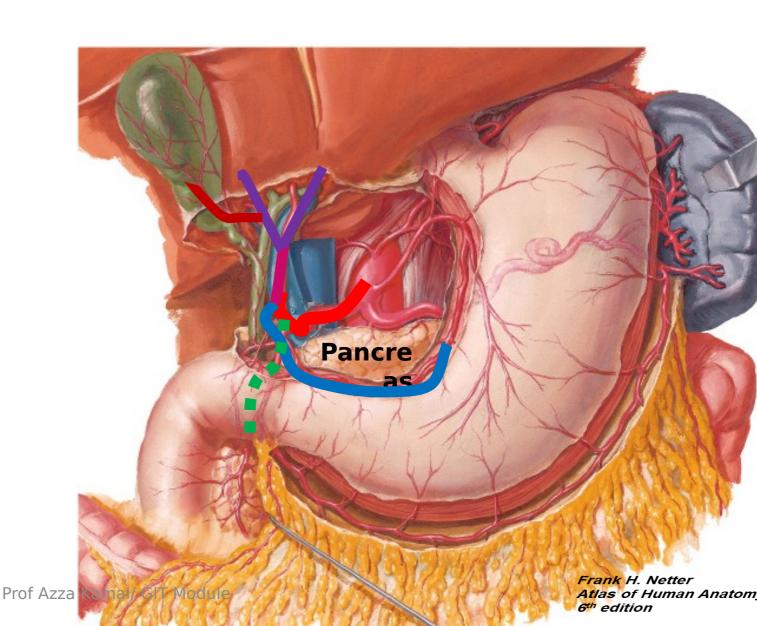
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- Branches of splenic artery:
 - 1. Pancreatic brs.
 - 2. Short gastric arteries (5-6): to fundus of stomach.
 - 3. Left gastroepiploic a.: along greater curvature of stomach.



Hepatic Artery

- Runs to the right
- Gives 2 brs : right gastric a ,& gastroduodenal a then becomes named hepatic artery proper.
- Ascends in the free border of the lesser omentum (left to the bile duct & anterior to portal vein).
- Ends in porta hepatis by dividing into right & left hepatic arteries.



- Branches of hepatic artery:
- 1. Gastroduodenal artery.
- 2.Supraduodenal artery ?: supplies sup. part of duodenum.
- 3.Right gastric: passes along the lesser curvature to anastomose with the left gastric.

4.Right hepatic a. cystic state of the state

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Gastroduodenal artery:

Descends posterior to the 1st part of the duodenum, then divides into 2 br.

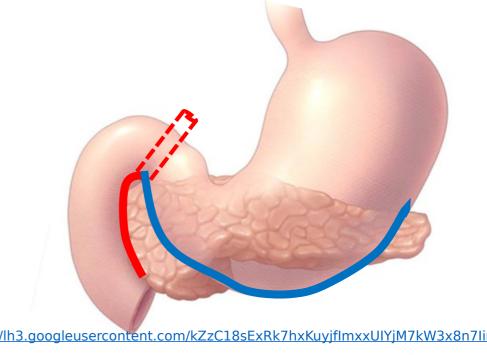
1. Sup. Pancreaticoduodenal artery:

Descends bet. duodenum & head of the pancreas.

2. Right gastroepiploic artery:

Runs to the left along the greater curvature to anastomose with the left gastroepiploic a.

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Test Yourself

A surgeon operating on the spleen ligated a tortuous artery passing along the upper border of the pancreas. This artery is a branch from which of the following?

A.Hepatic

BLeft gastric

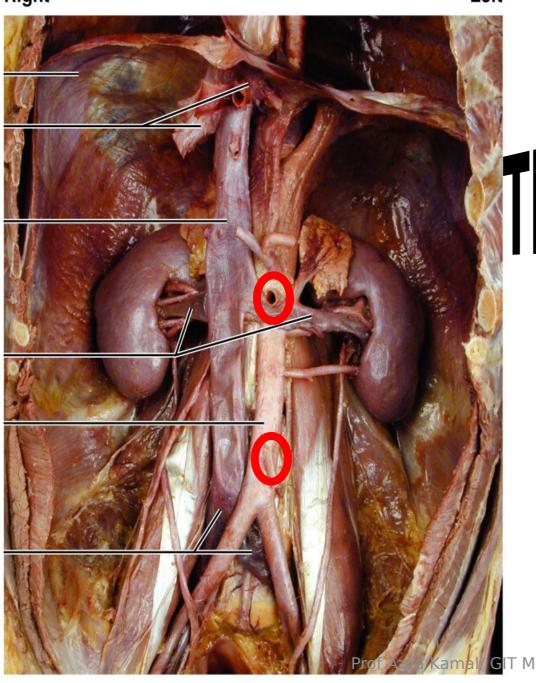
C.Coeliac trunk

D.Superior mesenteric

Elnferior mesenteric



Right Left



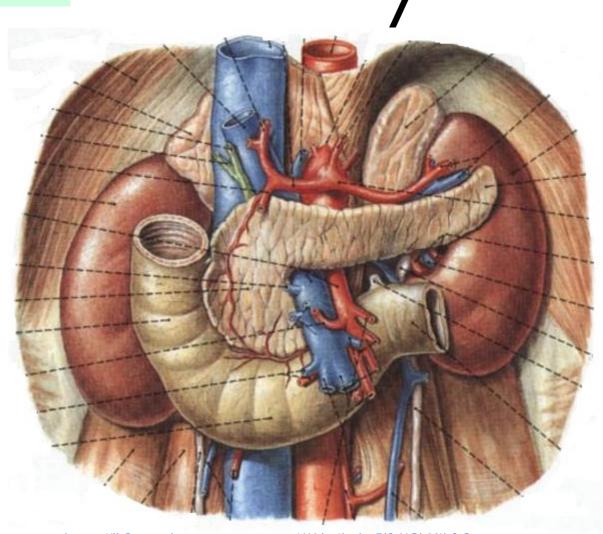
THE SUPERIOR & INFERIOR MESENTERIC ARTERIES

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THE SUPERIOR MESENTERIC ARTERY

- Begins from the abdominal aorta opposite lower border of L1.
- Arises behind the body of the pancreas.

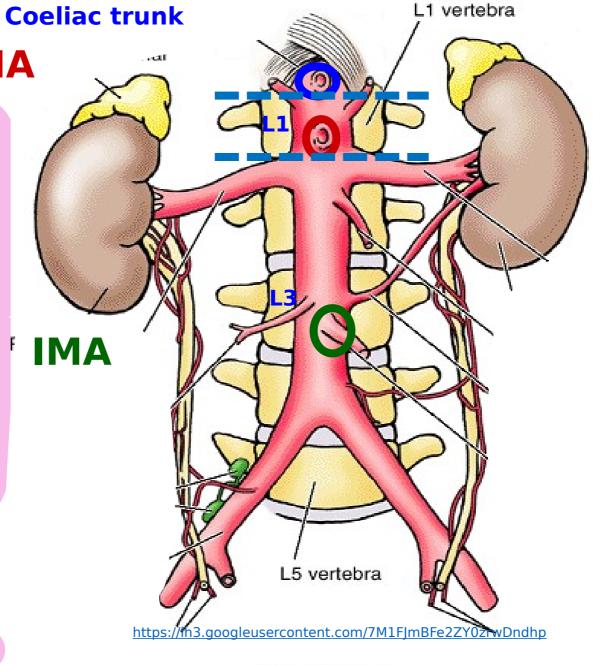
Coeliac trunk



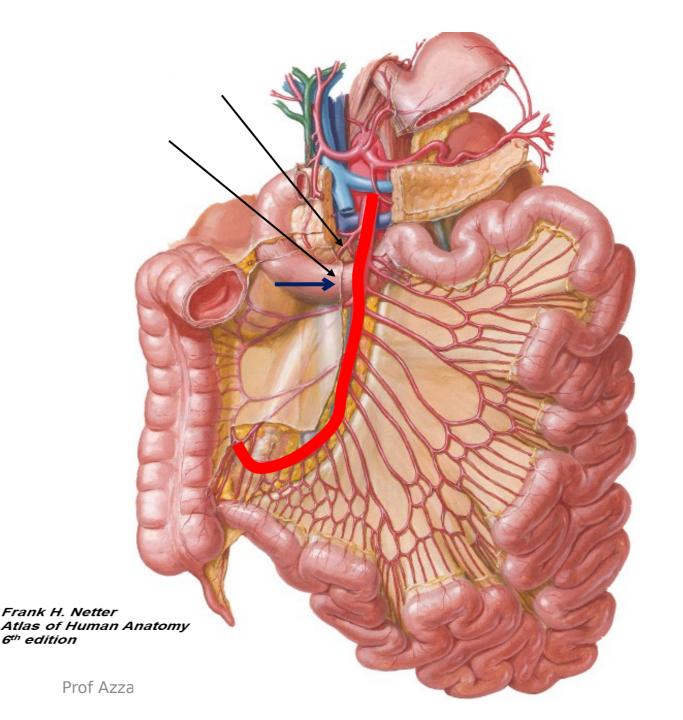
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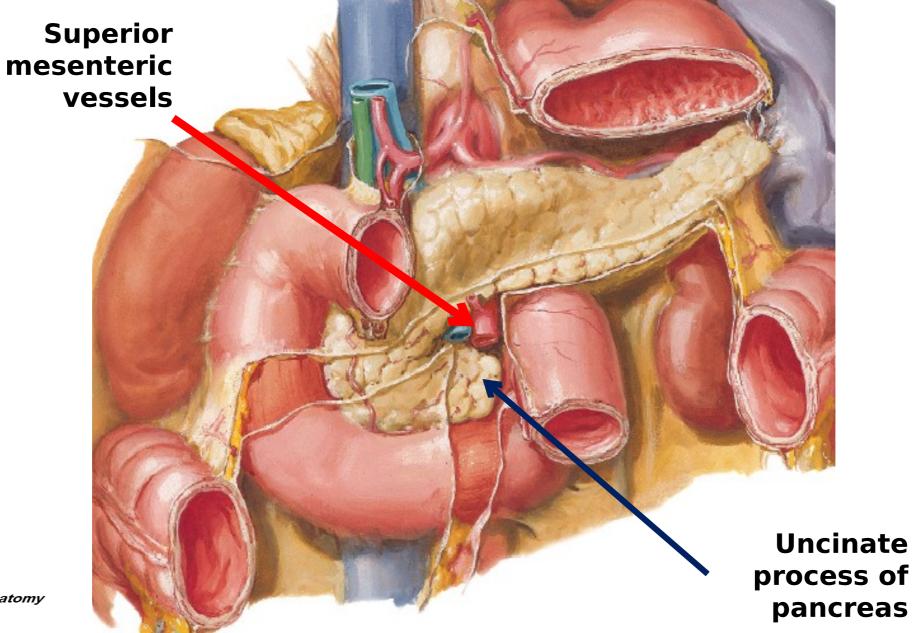
SMA

SMA arises from abdominal aorta opposite lower border of

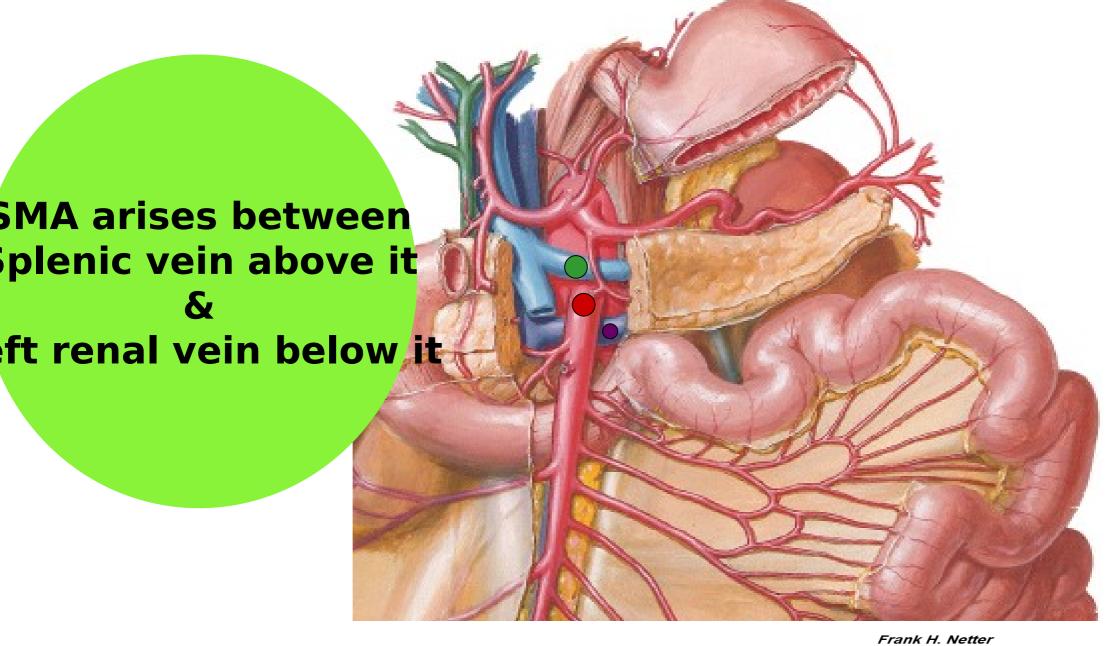


•Course: it runs downward & to the right crossing uncinate process of pancreas, 3rd part of the duodenum, then in root of mesentry down to right iliac fossa.



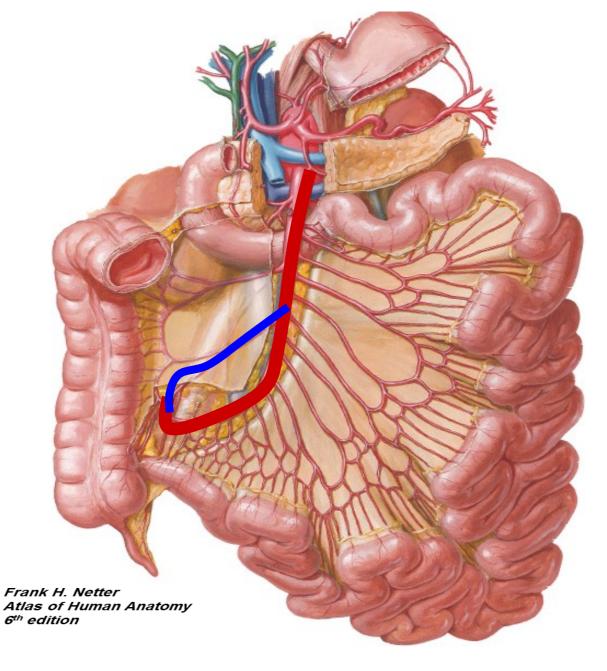


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• Ends by anastomos ing with the ileal branches of ileocolic artery

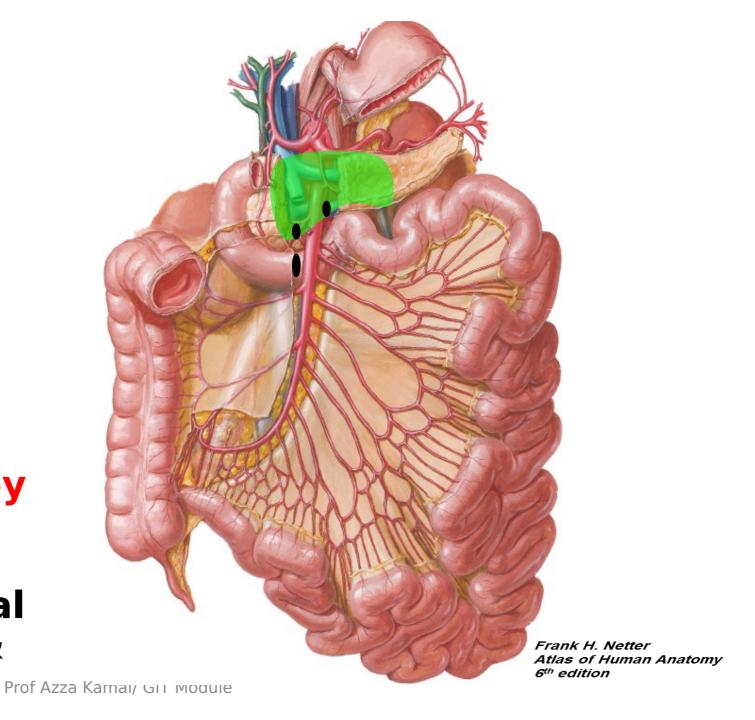


• Relations:

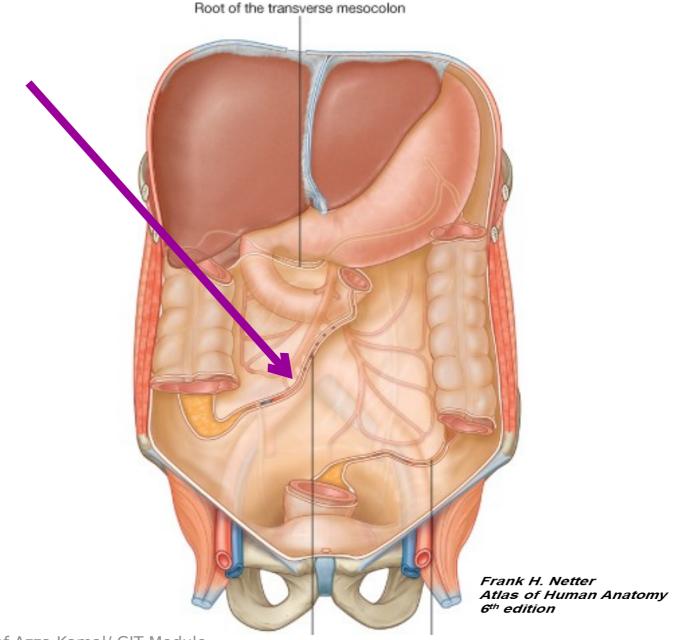
Ant.: Body of the pancreas.

Post.:

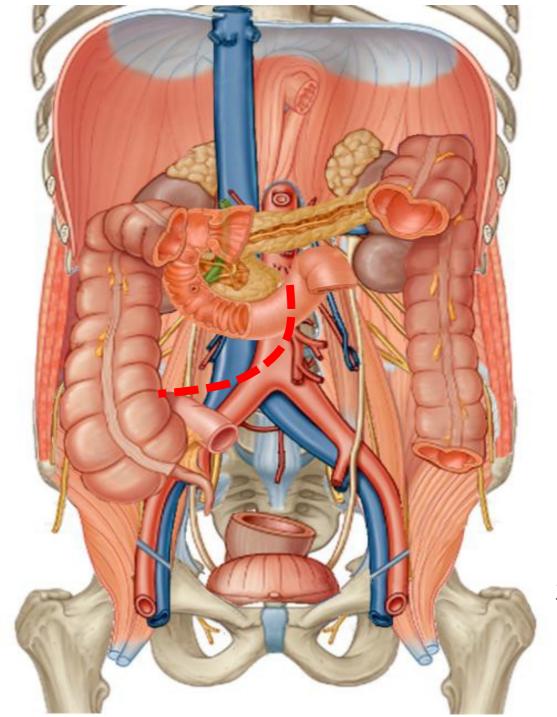
- Left renal vein
- Uncinate process of pancreas
- >3rd part of the duodenum
- Structures crossed by the root of mesentry (aorta, IVC, rt. psoas major& genitofemoral n, right gonadal vs & rt.ureter).



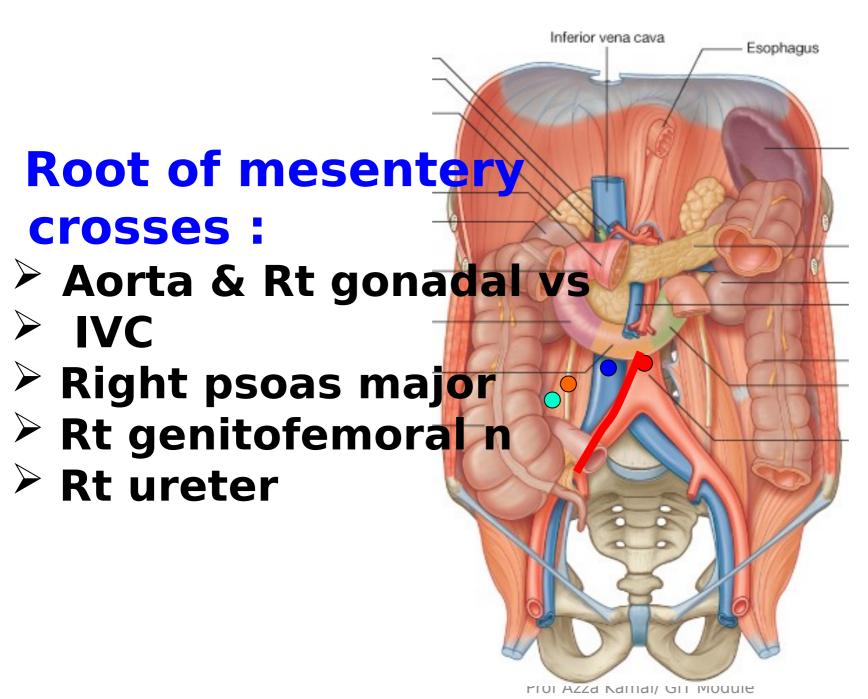
- Root of mesentery crosses the following structures:
- Aorta & Rt gonadal vs
- Right psoas major
- RtGenitofemoral n
- Rt ureter



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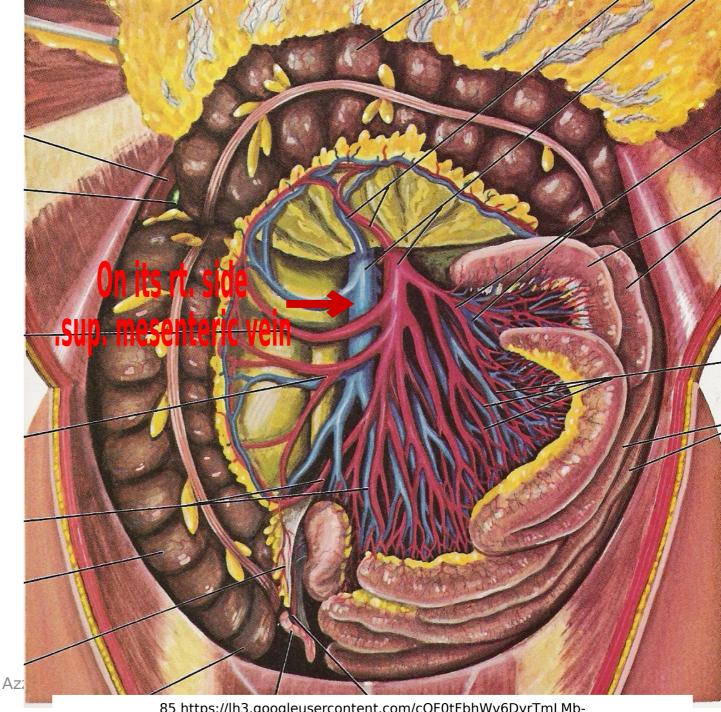
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Superior mesenteric vein:

- **✓ It drains small** intestine, caecum, ascending & part of tr colon
- ✓ It ends by joining splenic vein behind neck of pancreas to form **Portal Vein**

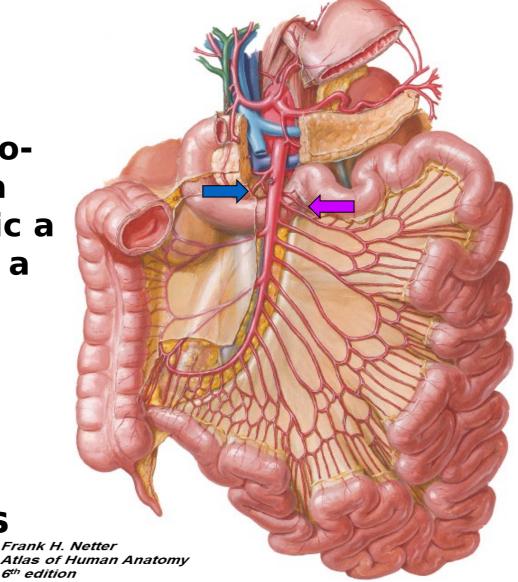


• Branches of SMA:

2 groups of branches:

- ✓ 4 branches from the right concave side.
- 2 sets of brs. from the left convex side.

From Right Side: 1)Inferior pancreaticoduodenal a 2) Middle colic a 3) Right colic a 4) lleocolic a **From Left** Side: 1)Jejunal brs 2) Ileal brs

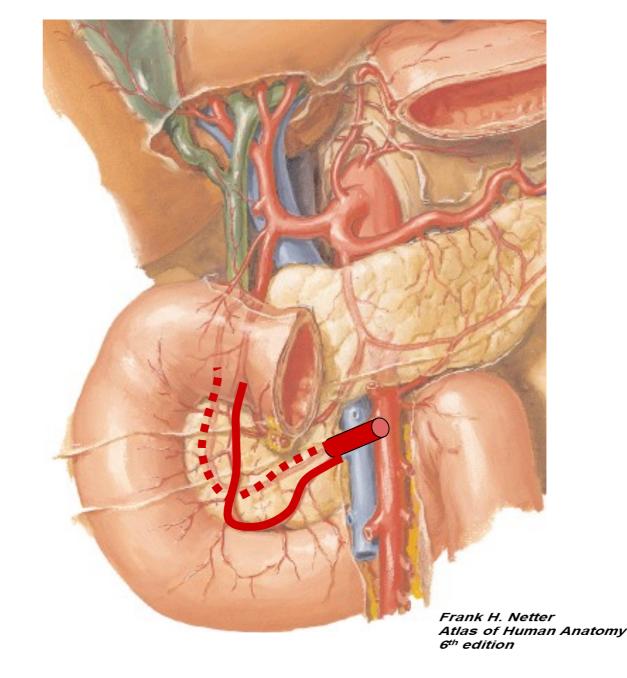


A. Branches from the right side

Inferior.1 pancreaticoduoden :al artery

Divides into ant. & post. branches which anastomoses with similar branches of sup. pancreaticoduodenal artery

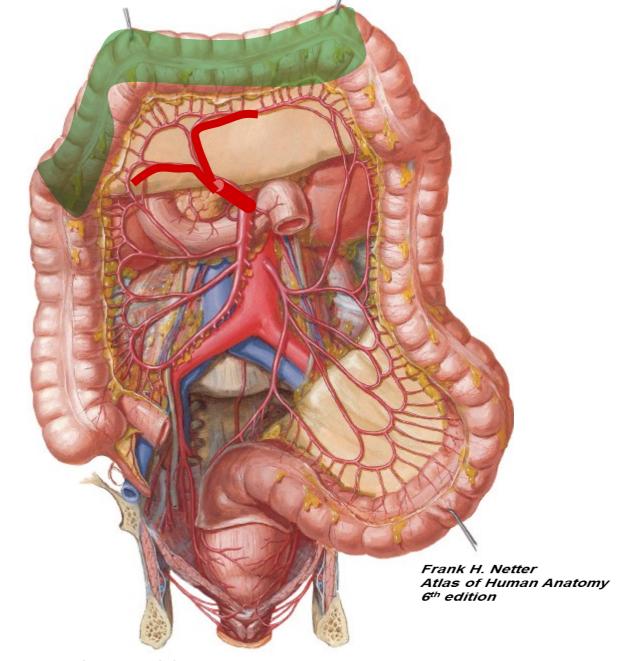
Supplies duodenum, head & uncinate process of the pancreas



2. Middle colic artery:

Divides into right & left branches which anastomose with adjacent arteries through the marginal artery.

Supplies the right 2/3 of the transverse colon.

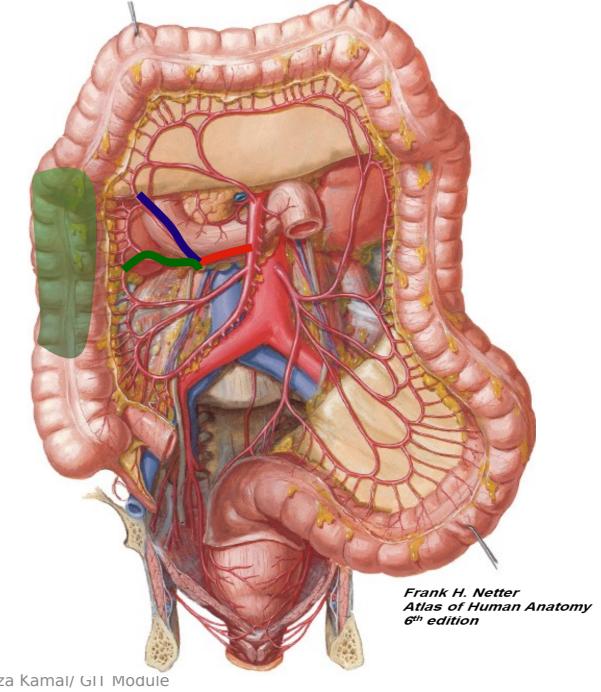


3. Right colic artery:

Divides into ascending & descending branches which

Anastomoses with adjacent arteries through the marginal artery

Supplies the upper 2/3 of the ascending colon.



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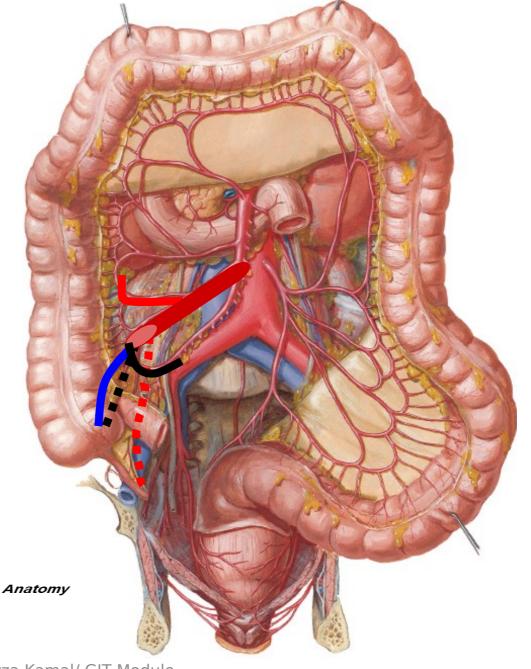
4. Iliocolic artery: divides into:

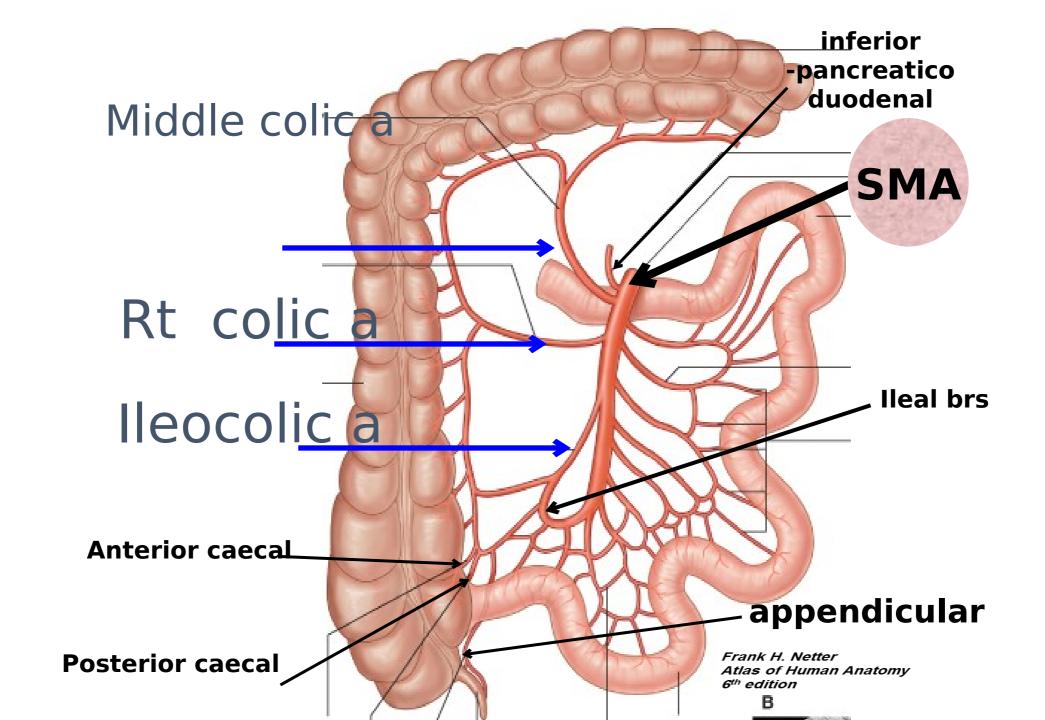
a. Ascending colic artery: to ascending colon

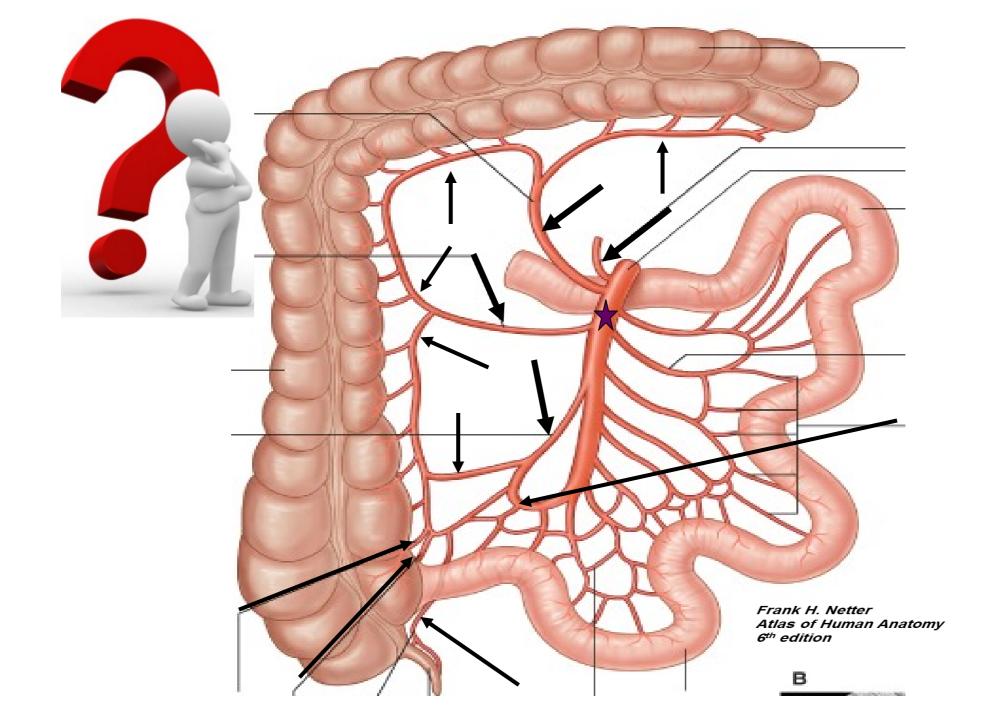
b. Anterior & posterior caecal: to caecum.

c. Appendicular: to appendix.

d. Ileal branch: to the terminal ileum & anastomoses with Atlas of Human Anatomy the end of SMA. Atlas of Human Anatomy 6th edition



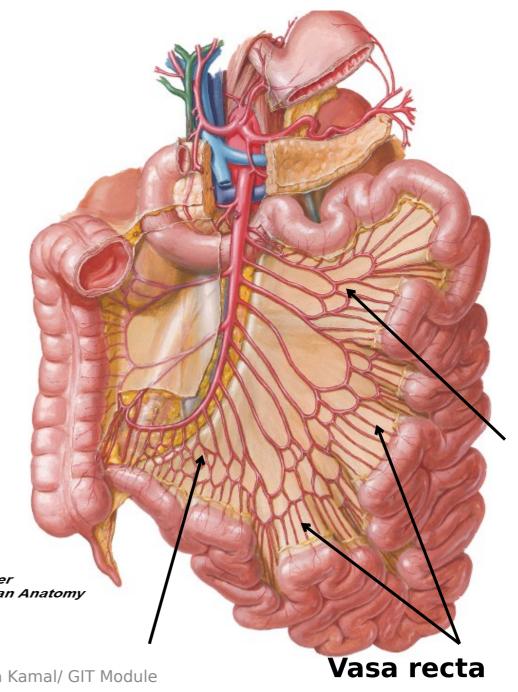




B. Branches from the left side of SMA:

- ✓ Jejunal branches usually form 1-2 arcades.
- ✓ Ileal branches usually form 3-5 arcades.

The last arcade sends straight arteries (vasa rectae) of Human Anatomy to the small intestine. These are of Azza Kamal/ GIT Module



·SMA

- ✓ Origin between 2 veins
- ✓ Passing on 2 p's
- ✓ Loooong course in root of mesentery passing on 5 different

structures:

- 1) Artery & its br
- 2) Vein
- 3) Muscle
- 4) Nerve
- 5) Duct

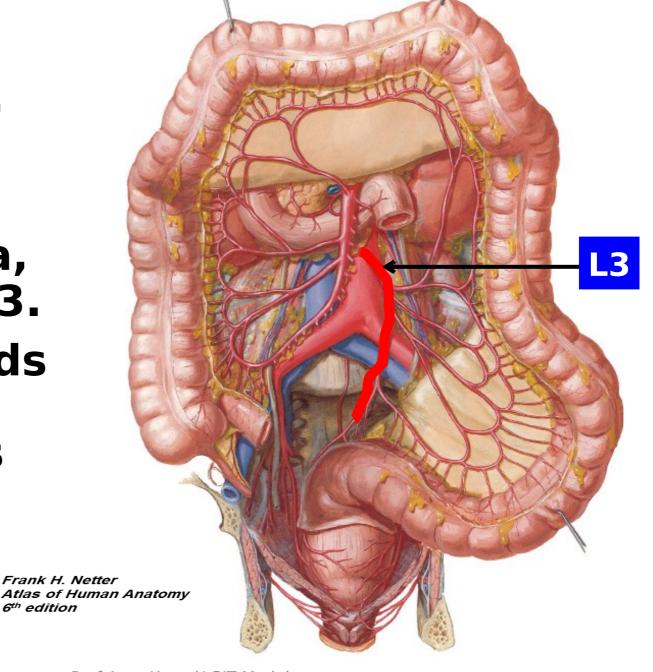


All are branches of the superior mesenteric artery, <u>Except:</u>

- A. Left colic artery
- **B.** Middle colic artery
- C. Right colic artery
- D. Inferior pancreaticoduodenal arter
- E. Ileocolic artery

The inferior mesenteric artery

- Begins from abdominal aorta, at the level of L3.
- Course: Descends downward & to the left towards the left iliac fossa.



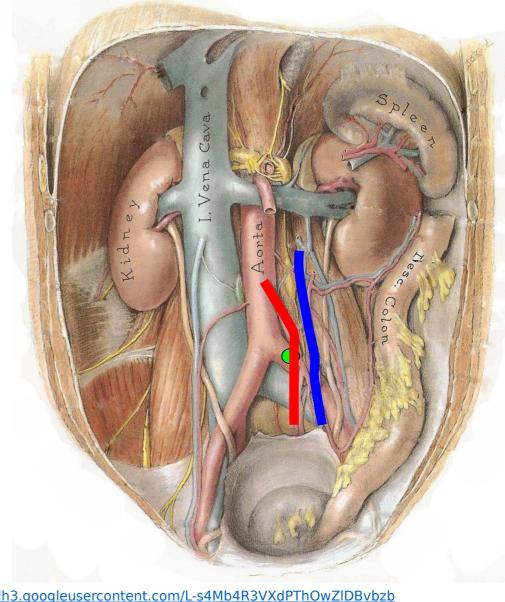
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Inferior mesenteric vein:

Begins as upward continuation of superior rectal vein.

Ascends behind body of pancreas to End in Splenic Vein

Drains descending colon, sigmoid

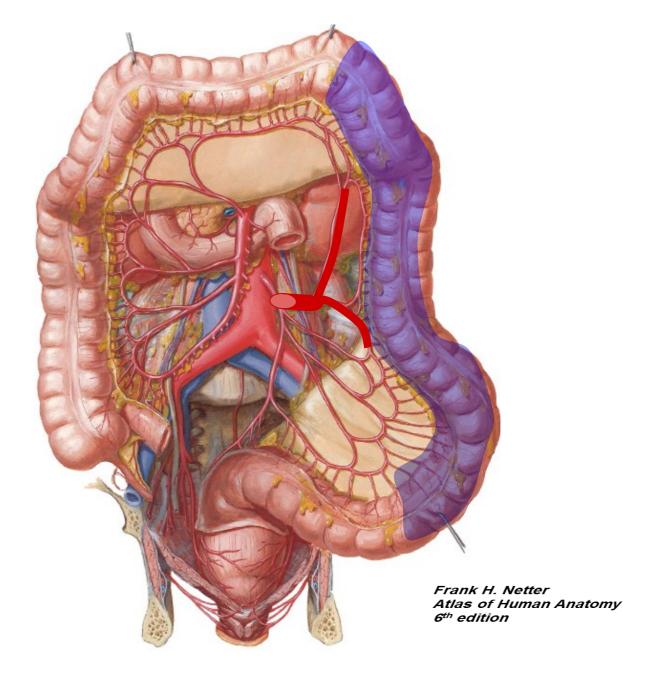


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•Branches of IMA:

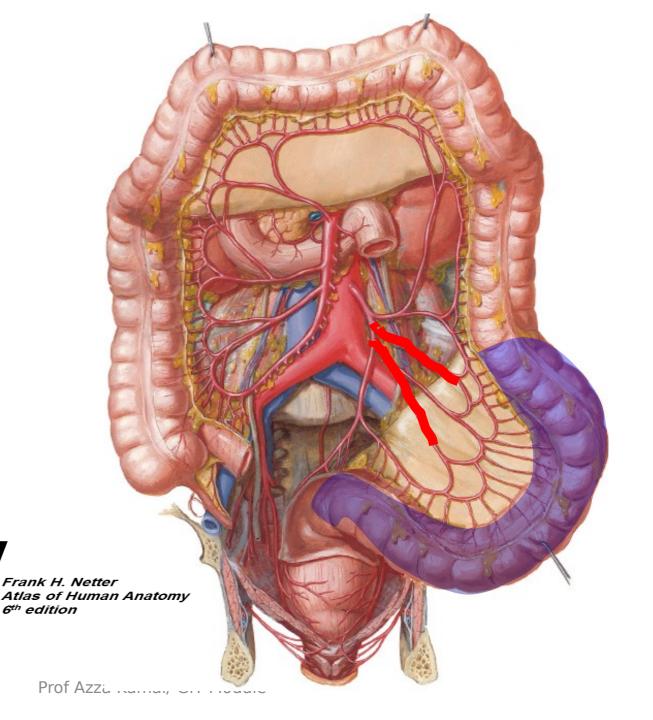
1Left colic artery:

- ✓ Divides into ascending & descending branches.
- ✓ Supplies the left 1/3 of the transverse colon, left colic flexure & descending colon.
- **✓Shares** in formation of the marginal artery.



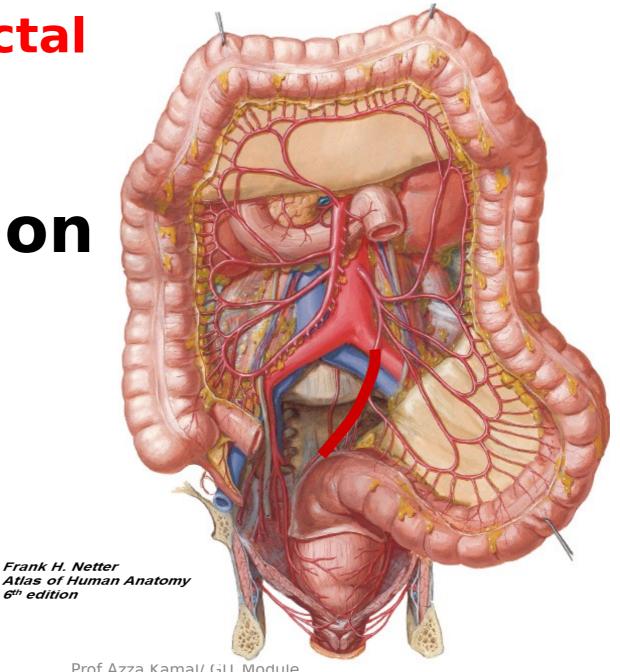
2. Sigmoid Arteries:

Supply descending & .sigmoid colon Share in the .marginal artery



3. Superior rectal artery:

It is the continuation of IMA.

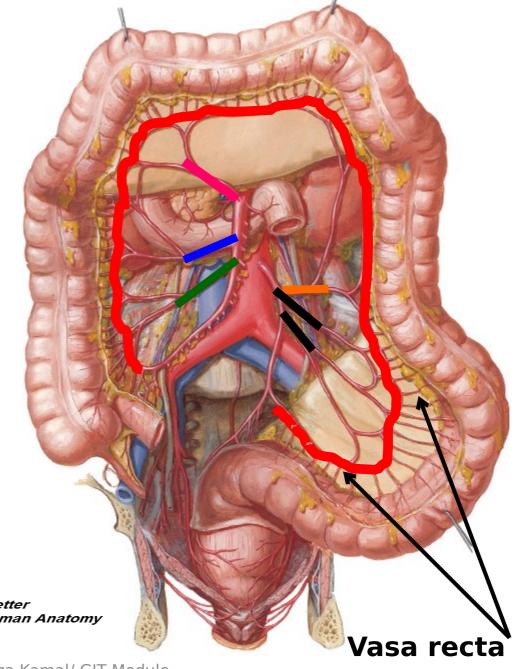


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Marginal artery

- It is an arterial arcade lying along the concavity of the colon
- It extends from the caecum to the recto-sigmoid junction
- It is formed by the anastomosis between the 3 colic branches of the SMA (ileocolic, right colic, middle colic) & the 2 branches of the IMA (left colic, sigmoid arteries)
- Vasa recta arise from the marginal artery to supply the edition
 colon



Test Yourself

While reviewing an abdominal aortogram of a 67 years old man with abdominal aortic aneurysm, a radiologist noticed an occluded unpaired branch arising from the aorta at the level of L3. In this case, which of the following segments of the intestine is most likely to have preserved arterial supply?

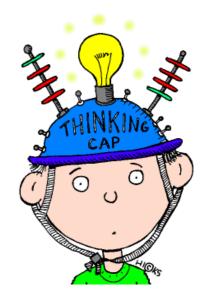
ACaecum.

BDescending colon.

CRectum.

DSigmoid colon.

ELeft colic flexure.



Concerning the inferior mesenteric artery, all are true, EXCEPT:



- A. Its colic branch supplies the descending colon
- B. It gives off the inferior pancreaticoduodenal artery
- C. It supplies the sigmoid colon
- D. Its branches contribute to the marginal artery
- E. It arises from abdominal aorta opposite L 3



Suggested Reading: Clinical anatomy by Systems: Richard S. Snell Pages 221-227